CLAIMS

I claim:

1. (Original) A combustion-based system, comprising:

a combustor for burning a combustible material, wherein an exhaust gas stream output by said combustor includes NO_2 and at least one metal including mercury;

at least one ultraviolet light source in optical communication with said exhaust gas stream, ultraviolet light from said light source photo-chemically dissociating at least a portion of said NO_2 to form an NO_2 reduced exhaust stream, and

a sorbent containing filter media for receiving said NO_2 reduced exhaust stream, said filter media trapping said at least one metal.

2. (Original) The system of claim 1, wherein said system comprises a fossil fuel fired power plant.

3. (Original) The system of claim 1, wherein said combustible material comprises coal.

4. (Original) The system of claim 1, wherein said system comprises a waste incinerator.

5. (Original) The system of claim 1, wherein said mercury in said exhaust stream is in the vapor phase.

6. (Original) The system of claim 1, further comprising a particle collection device for trapping said sorbent.

7. (Original) The system of claim 1, wherein said ultraviolet light source provides light in a wavelength range of 350 to 400 nm.

8. (Original) The system of claim 1, wherein said system reduces an amount of NO_2 in said exhaust gas to below 20 parts per million.

9. (Original) The system of claim 1, wherein said system reduces an amount of NO_2 in said exhaust gas to below 10 parts per million.

10. (Original) The system of claim 1, wherein said system is exclusive of catalyst particles.

11. (Original) The system of claim 1, wherein said sorbent media comprises activated carbon.

12. (Original) The system of claim 1, wherein said light source is disposed in said exhaust gas stream.

13. (Original) The system of claim 1, wherein said light source is disposed remote from said exhaust stream.

14. (Original) The system of claim 13, wherein a optical fiber network transmits said ultraviolet light to said exhaust stream.

15. (Original) A method for reducing mercury emissions from combustion-based systems, comprising the steps of:

irradiating an exhaust gas stream including mercury and NO_2 with ultraviolet light, said light photo-chemically dissociating at least a portion of said NO_2 to form an NO_2 reduced gas stream, and

contacting said NO_2 reduced gas stream with a sorbent material, wherein said sorbent traps said mercury.

16. (Original) The method of claim 14, wherein said ultraviolet light is in a wavelength range of 350 to 400 nm.

17. (Original) The method of claim 14, wherein said exhaust gas stream is generated by combusting coal.